INTERNATIONAL PHYTOBIOMES CONFERENCE 2018

INTERNATIONAL PHYTOBIOMES CONFERENCE 2018

4-6 DECEMBER

LE CORUM
MONTPELLIER
FRANCE

Sanguin 150

The human-driven impacts on a long-term affair between an iconic Mediterranean fruit tree and its microbiome

Hervé Sanguin[1,2]*, Frédéric Mahé[1,2], Lahcen Ouahmane[3], Pierre Tisseyre[1,4], Estelle Tournier[1,2], Hamza Khassali[1,2,3], Christine Le Roux[1,2], Yves Prin[1,2], Lucie Miché[5], Pascal Mirleau[5], Robin Duponnois[1,4], Jean-François Arrighi[1,4], Mohamed Hafidi[3], Ahmed Ouhammou[3], Bruno Vincentelli[6], Carole Anziani[6], Laetitia Hugo[6,7], Katia Diadema[8], Gonzalo Nieto Feliner[9], Fatma Mirleau[5], Magda Bou Dagher Kharrat[10], Stefano La Malfa[11], Frédéric Médail[5], Juan Viruel[12], Alex Baumel[5]
[1]LSTM, Univ Montpellier, CIRAD, IRD, INRA, Montpellier SupAgro, Montpellier, France
[2]CIRAD, UMR LSTM, F-34398 Montpellier, France
[3]University of Cadi Ayyad, Faculty of Sciences Semlalia, Laboratory of Ecology and Environment, 40000 Marrakesh, Morocco
[4]IRD, UMR LSTM, F-34398 Montpellier, France
[5]Aix Marseille Univ, Univ Avignon, CNRS, IRD, IMBE, Marseille, France
[6] Corsican Environmental Office (OEC), 20250, Corte, Corsica, France
[7]National Botanical Conservatory of Corsica (CBNC), 20250, Corte, Corsica, France
[8]National Mediterranean Botanical Conservatory (CBNMed), Hyères, France
[9]Real Jardín Botánico (CSIC), 28014 Madrid, Spain
[10]University of Saint-Joseph, Faculty of Sciences, Laboratory of Plant Genome Characterisation, 11072050 Beiruth, Lebanon
[11]University of Catania, Dipartimento di Agricoltura, Alimentazione e Ambiente (Di3A), 95123 Catania, Italy
[12]Royal Botanic Gardens, Kew, Richmond, Surrey, TW93DS, United Kingdom

The Mediterranean thermophilous woodlands were shaped by human activities for millenia, mainly for forage and fruits harvest. The recurring exchanges that followed between forests and cultivated areas have constituted a pivotal aspect in the process of Mediterranean fruit tree domestication. Since its domestication in the Middle-East around 6,000-4,000 years BP, the carob tree, Ceratonia siliqua L. (Leguminosae), has probably experienced extensive genetic and physiological modifications conducing to potential changes of a major compartment of its functioning: the microbiome. The carob tree is highly dependent of arbuscular mycorrhizal (AM) symbiosis, but some evidences tends to demonstrate bacterial endophytes as a second major symbiotic partner. In the framework of the international project DYNAMIC (Deciphering sYmbiotic Networks in cArob-based MedIterranean agro-eCosystems), high-throughput sequencing methods were applied to estimate several proxies of the carob tree-microbiome diversity and to correlate it to carob tree ecology and phylogeography at the Mediterranean scale. The results provide new insights into the characterization of a Mediterranean core and accessory carob tree-microbiome, highlighting geographical patterns, as well as the contribution of host genetic diversity, habitat and edaphic parameters. New avenues for reflexion regarding the relative role of history and habitat (cultivated vs wild) as drivers of tree-microbiome are also proposed. The conclusions open up promising perspectives for the development of more efficient strategies in conservation and agroecology based on tree-microbiome management.